



Sequence Listing

<110> Walter Reed Army Institute of Research
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Barbosa, Arnaldo

<120> Expression, Purification, and Uses of a *Plasmodium falciparum* Liver Stage Antigen 1 Polypeptide

<130> 003/285/SAP

<140> 10/706,435

<141> 2003-11-12

<150> 60/425,719

<151> 2002-11-12

<160> 28

<170> Microsoft Word XP

<210> 1

<211> 17

<212> PRT

<213> *P. falciparum* LSA-1

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<223> LSA-1 major 17 amino acid repeat

<400> 1

Glu Gln Gln Ser Asp Leu Glu Gln Glu Arg
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Leu Ala Lys Glu Lys Leu Gln
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<210> 2

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<213> *P. falciparum* LSA-1

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<223> LSA-1 minor 17 amino acid repeat

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Glu Gln Gln Arg Asp Leu Glu Gln Glu Arg
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Leu Ala Lys Glu Lys Leu Gln
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acaaggaagg	caaactgatt	gaacatatca	tcaacgacga	320
cgatgacaaa	aaaaaataca	ttaaaggcca	ggatgaaaat	360
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accaacgtgg	aaggccgcgc	cgacatccac	aaaggccacc	760
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aaacgaaaaa	ctggacgacc	tggaacgaag	catcgaaaaa	1080
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cgacaaatcc	ctctacgacg	agcacattaa	aaaatacaaa	1200
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				15					20	
Asn	Ser	Arg	Asn	Arg	Ile	Asn	Glu	Glu	Lys	
				25					30	
His	Glu	Lys	Lys	His	Val	Leu	Ser	His	Asn	
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Ser	Tyr	Glu	Lys	Thr	Lys	Asn	Asn	Glu	Asn	
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Asn	Lys	Phe	Phe	Asp	Lys	Asp	Lys	Glu	Leu	
				55					60	
Thr	Met	Ser	Asn	Val	Lys	Asn	Val	Ser	Gln	
				65					70	
Thr	Asn	Phe	Lys	Ser	Leu	Leu	Arg	Asn	Leu	
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Gly	Val	Ser	Glu	Asn	Ile	Phe	Leu	Lys	Glu	
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Asn	Lys	Leu	Asn	Lys	Glu	Gly	Lys	Leu	Ile	
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Glu	His	Ile	Ile	Asn	Asp	Asp	Asp	Asp	Lys	
				105					110	
Lys	Lys	Tyr	Ile	Lys	Gly	Gln	Asp	Glu	Asn	
				115					120	
Arg	Gln	Glu	Asp	Leu	Glu	Glu	Lys	Ala	Ala	
				125					130	
Glu	Gln	Gln	Ser	Asp	Leu	Glu	Gln	Glu	Arg	
				135					140	
Leu	Ala	Lys	Glu	Lys	Leu	Gln	Glu	Arg	Leu	
				145					150	
Ala	Lys	Glu	Lys	Leu	Gln	Glu	Gln	Gln	Arg	
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Asp	Leu	Glu	Gln	Arg	Lys	Ala	Asp	Thr	Lys	
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Lys	Asn	Leu	Glu	Arg	Lys	Lys	Glu	His	Gly	
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Asp	Val	Leu	Ala	Glu	Asp	Leu	Tyr	Gly	Arg	
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Leu	Glu	Ile	Pro	Ala	Ile	Glu	Leu	Pro	Ser	
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Glu	Asn	Glu	Arg	Gly	Tyr	Tyr	Ile	Pro	His	
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Gln	Ser	Ser	Leu	Pro	Gln	Asp	Asn	Arg	Gly	
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Asn	Ser	Arg	Asp	Ser	Lys	Glu	Ile	Ser	Ile	
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Ile	Glu	Lys	Thr	Asn	Arg	Glu	Ser	Ile	Thr	
				235					240	
Thr	Asn	Val	Glu	Gly	Arg	Arg	Asp	Ile	His	
				245					250	
Lys	Gly	His	Leu	Glu	Glu	Lys	Lys	Asp	Gly	
				255					260	

Ser	Ile	Lys	Pro	Glu	Gln	Lys	Glu	Asp	Lys	
				265						270
Ser	Ala	Asp	Ile	Gln	Asn	His	Thr	Leu	Glu	
				275						280
Thr	Val	Asn	Ile	Ser	Asp	Val	Asn	Asp	Phe	
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Gln	Ile	Ser	Lys	Tyr	Glu	Asp	Glu	Ile	Ser	
				295						300
Ala	Glu	Tyr	Asp	Asp	Ser	Leu	Ile	Asp	Glu	
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Glu	Glu	Asp	Asp	Glu	Asp	Leu	Asp	Glu	Phe	
				315						320
Lys	Pro	Ile	Val	Gln	Tyr	Asp	Asn	Phe	Gln	
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Asp	Glu	Glu	Asn	Ile	Gly	Ile	Tyr	Lys	Glu	
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Leu	Glu	Asp	Leu	Ile	Glu	Lys	Asn	Glu	Asn	
				345						350
Leu	Asp	Asp	Leu	Asp	Glu	Gly	Ile	Glu	Lys	
				355						360
Ser	Ser	Glu	Glu	Leu	Ser	Glu	Glu	Lys	Ile	
				365						370
Lys	Lys	Gly	Lys	Lys	Tyr	Glu	Lys	Thr	Lys	
				375						380
Asp	Asn	Asn	Phe	Lys	Pro	Asn	Asp	Lys	Ser	
				385						390
Leu	Tyr	Asp	Glu	His	Ile	Lys	Lys	Tyr	Lys	
				395						400
Asn	Asp	Lys	Gln	Val	Asn	Lys	Glu	Lys	Glu	
				405						410
Lys	Phe	Ile	Lys	Ser	Leu	Phe	His	Ile	Phe	
				415						420
Asp	Gly	Asp	Asn	Glu	Ile	Leu	Gln	Ile	Val	
				425						430
Asp	Glu	Arg	Leu	Ser	Glu	Asp	Ile	Thr	Lys	
				435						440
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Pro	His	His	His	His	His	His				
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<210> 5

<211> 17

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<223> LSA-1 Consensus sequence of 17 amino acid repeats where Xaa at position 1 is either Glu or Gly; Xaa at position 4 is Ser or Arg; Xaa at position 6 is Asp or Ser; Xaa at position 9 is Glu or Asp; Xaa at position 11 is Leu or Arg; Xaa at position 13 is Lys or Asn and Xaa at position 15 is Lys or Thr or Arg.

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Xaa Gln Gln Xaa Asp Xaa Glu Gln Xaa Arg
 5 10

Xaa Ala Xaa Glu Xaa Leu Gln
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<210> 6

<211> 24

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<213> *P. falciparum* LSA-1

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<223> *P. falciparum* LSA-1 T1 epitope

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 5 10

Gln Thr Asn Phe Lys Ser Leu Leu Arg Asn
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Leu Gly Val Ser

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<213> *P. falciparum* LSA-1

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<223> *P. falciparum* LSA-1 LSA-Rep epitope

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Leu Ala Lys Glu Lys Leu Gln
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<210> 8

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<223> *P. falciparum* LSA-1 J epitope

<400> 8

Glu Arg Leu Ala Lys Glu Lys Leu Gln Glu
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Gln Gln Arg Asp Leu Glu Gln
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<220>

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Thr Lys Lys Asn Leu Glu Arg Lys Lys Glu
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<223> *P. falciparum* LSA-1 LSA-Ter epitope

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 Leu Gly Val Ser

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<213> *P. falciparum* LSA-1

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<223> *P. falciparum* LSA-1 LSA1.1 epitope

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<213> *P. falciparum* LSA-1

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<223> *P. falciparum* LSA-1 Doolan 1671 epitope

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<213> *P. falciparum* LSA-1

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<223> Amino acid sequence of LSA-NRC(H) repeat sequence between N & C terminals

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Asp Leu Glu Gln

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<210> 25

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<223> DNA sequence of the gene LSA-NRC(H)

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tcctacgaga agactaaaaa caacgaaaac aacaaattct   160
ttgacaagga caaagagctg acgatgagca acgttaaaaa   200
cgtatcccag accaacttta aatccctcct gcgcaacctc   240
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acaaggaagg caaactgatt gaacatatca tcaacgacga   320

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aacgacaagc aagtgaacaa ggaaaaggaa aaatttatca 1240
aatccctctt ccacatcttc gatggcgata acgaaattct 1280
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<210> 26
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<223> LSA-NRC(H) protein
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Ile Lys Ser Asn Leu Arg Ser Gly Ser Ser
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      25                             30
His Glu Lys Lys His Val Leu Ser His Asn
      35                             40
Ser Tyr Glu Lys Thr Lys Asn Asn Glu Asn
      45                             50
Asn Lys Phe Phe Asp Lys Asp Lys Glu Leu
      55                             60
Thr Met Ser Asn Val Lys Asn Val Ser Gln
      65                             70
Thr Asn Phe Lys Ser Leu Leu Arg Asn Leu
      75                             80
Gly Val Ser Glu Asn Ile Phe Leu Lys Glu
      85                             90

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Asn	Lys	Leu	Asn	Lys	Glu	Gly	Lys	Leu	Ile		
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				105						110	
Lys	Lys	Tyr	Ile	Lys	Gly	Gln	Asp	Glu	Asn		
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Arg	Gln	Glu	Asp	Leu	Glu	Glu	Lys	Ala	Ala		
				125						130	
Glu	Gln	Gln	Ser	Asp	Leu	Glu	Gln	Glu	Arg		
				135						140	
Leu	Ala	Lys	Glu	Lys	Leu	Gln	Glu	Arg	Leu		
				145						150	
Ala	Lys	Glu	Lys	Leu	Gln	Glu	Gln	Gln	Arg		
				155						160	
Asp	Leu	Glu	Gln	Arg	Lys	Ala	Asp	Thr	Lys		
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Lys	Asn	Leu	Glu	Arg	Lys	Lys	Glu	His	Gly		
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Asp	Val	Leu	Ala	Glu	Asp	Leu	Tyr	Gly	Arg		
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Leu	Glu	Ile	Pro	Ala	Ile	Glu	Leu	Pro	Ser		
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Glu	Asn	Glu	Arg	Gly	Tyr	Tyr	Ile	Pro	His		
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Gln	Ser	Ser	Leu	Pro	Gln	Asp	Asn	Arg	Gly		
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Asn	Ser	Arg	Asp	Ser	Lys	Glu	Ile	Ser	Ile		
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Ile	Glu	Lys	Thr	Asn	Arg	Glu	Ser	Ile	Thr		
				235						240	
Thr	Asn	Val	Glu	Gly	Arg	Arg	Asp	Ile	His		
				245						250	
Lys	Gly	His	Leu	Glu	Glu	Lys	Lys	Asp	Gly		
				255						260	
Ser	Ile	Lys	Pro	Glu	Gln	Lys	Glu	Asp	Lys		
				265						270	
Ser	Ala	Asp	Ile	Gln	Asn	His	Thr	Leu	Glu		
				275						280	
Thr	Val	Asn	Ile	Ser	Asp	Val	Asn	Asp	Phe		
				285						290	
Gln	Ile	Ser	Lys	Tyr	Glu	Asp	Glu	Ile	Ser		
				295						300	
Ala	Glu	Tyr	Asp	Asp	Ser	Leu	Ile	Asp	Glu		
				305						310	
Glu	Glu	Asp	Asp	Glu	Asp	Leu	Asp	Glu	Phe		
				315						320	
Lys	Pro	Ile	Val	Gln	Tyr	Asp	Asn	Phe	Gln		
				325						330	
Asp	Glu	Glu	Asn	Ile	Gly	Ile	Tyr	Lys	Glu		
				335						340	
Leu	Glu	Asp	Leu	Ile	Glu	Lys	Asn	Glu	Asn		
				345						350	
Leu	Asp	Asp	Leu	Asp	Glu	Gly	Ile	Glu	Lys		
				355						360	

Ser	Ser	Glu	Glu	Leu	Ser	Glu	Glu	Lys	Ile
				365					370
Lys	Lys	Gly	Lys	Lys	Tyr	Glu	Lys	Thr	Lys
				375					380
Asp	Asn	Asn	Phe	Lys	Pro	Asn	Asp	Lys	Ser
				385					390
Leu	Tyr	Asp	Glu	His	Ile	Lys	Lys	Tyr	Lys
				395					400
Asn	Asp	Lys	Gln	Val	Asn	Lys	Glu	Lys	Glu
				405					410
Lys	Phe	Ile	Lys	Ser	Leu	Phe	His	Ile	Phe
				415					420
Asp	Gly	Asp	Asn	Glu	Ile	Leu	Gln	Ile	Val
				425					430
Asp	Glu	Leu	Ser	Glu	Asp	Ile	Thr	Lys	Tyr
				435					440
Phe	Met	Lys	Leu	Gly	Gly	Ser	Gly	Ser	Pro
				445					450
His	His	His	His	His	His				
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<210> 27

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<212> PRT

<213> Artificial sequence

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<223> derived LSA-1 peptide PL910

<400> 27

Val Ser Gln Thr Asn Phe Lys Ser Leu

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<211> 8

<212> PRT

<213> Artificial sequence

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<223> derived LSA-1 peptide PL911

<400> 28

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